How can I make sure that the multiple systems are not interfering with each other?

First, it is always a good idea to consult the manufacturer's guidelines for frequency selection.

Second, you might want to perform a listening test. Turn all of the systems on at once. Put the transmitters where they will be during the service.

Then take each transmitter and, while talking or singing, walk around the entire worship platform and even up into the back rows. You will then determine if there is any interference and check for dropouts at the same time.

Note that this will only help you determine if your own systems are compatible. Systems being used by nearby organizations might still cause interference.

Can I mix and match wireless systems from multiple manufacturers?

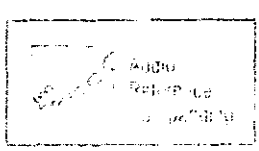
Yes, but here again frequency coordination could be an issue. It's best to contact a sound contractor, your audio representative, or one of the two manufacturers directly before doing so.

Do wireless microphones increase the likelihood of feedback?

Not because they are wireless, but because of the ability to take the microphones places where the feedback might occur. (I.e. the pastor walking in front of a loudspeaker)

Can I bring my wireless microphone on the road with me?
...to other houses of worship?

This is covered within this booklet, but the short answer is: maybe. It depends on the frequency at which your system is set. If it is on the same frequency as a local TV channel or another wireless system, you will have trouble. If you know you will need to travel before you purchase the system, you should consider one that is frequency agile or can automatically search for open frequencies.



What is ARC?

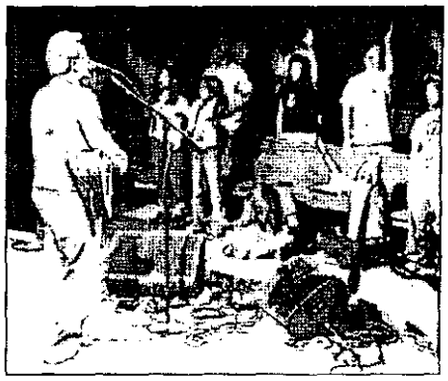
ARC or Audio Reference Companding is a proprietary Shure solution that enables a wireless microphone to sound more like a wired microphone, with less noise and greater dynamic range than other wireless systems.

Tell me straight. Don't wired microphones sound better and aren't they easier to use?

Many people believe wired microphones sound better than their wireless counterparts, but this gap has closed dramatically in recent years. Additionally, most people now believe that the added mobility of wireless microphones more than offsets any perceived difference in sound.

Chapter III: PERSONAL MONITORING SYSTEMS

Descriptions/Types



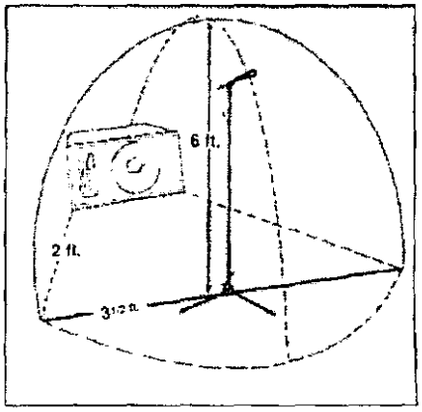
Praise and worship leaders and musicians all need to hear themselves as they speak, sing and play. Otherwise, they will have little idea if they are on *key*, on *cue*, or even *on* at all. For this reason, they need to monitor their sound.

Traditionally these monitors have been speakers (called *floor monitors or floor wedges*) aimed towards the individual – instead of towards the congregation – and often include just the portion of the overall mix.

As you have likely heard, the sound on the platform itself is usually loud, confusing, and requires the musician to stand in a specific spot in order to make any sense of what he or she is hearing.

There are many downsides to floor monitors:

- ***They are the major reason why the platform is so loud.*** So loud, in fact, that the main members of the worship team have trouble hearing and being heard. When musicians can't hear themselves and ask to have their monitor volumes increased, they frequently get involved in a "volume war," creating an endless cycle of ever-increasing levels on the platform.
- ***The congregation in the first few rows can hear these speakers.*** This increases the overall volume of what they hear while decreasing the overall clarity – especially since they are hearing only parts of the full sound from in front of them and the entire sound from behind or sides. Since the congregation has to concentrate more to hear clearly, they get tired more quickly (this phenomenon is called listener fatigue) which dramatically decreases the overall impact of your service.
- ***They negatively affect the quality of the sound.*** Monitors can be reflected off a wall behind the platform and cause echoing and timing problems. Additionally they only provide a 'mono' sound to the people using them, making them inferior to other modes of monitoring.
- ***Floor monitors limit mobility***, since the praise leader and the musicians must stand in a 'sweet spot' to hear themselves play.



Sweet spot created by a monitor wedge

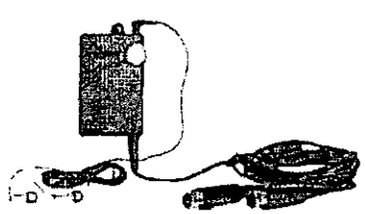
- ***The monitors and cables used to operate them make for a messy platform***, hinder line-of-sight for the people in the front, and add obstructions for the worship team.
- ***Floor monitors are the primary cause of feedback***. The #1 reason for feedback is when a microphone picks up sound from a loudspeaker. Since the floor monitors point directly at people using microphones, the likelihood of feedback is considerable.
- ***They are heavy and hard to transport to other venues***. This is a large concern for bands that take their worship on the road and for portable churches.
- ***There are hidden costs to floor monitors***, since they also require amps and cables, as well as possibly an EQ system.
- ***Last, but far from least, floor monitors increase the risk of damage to your hearing***. Most musicians like to turn their monitors up to hear themselves better, which, if done too much and too often, can lead to serious and permanent hearing loss.

So the question now, is: "If floor monitors are not ideal, why do so many houses of worship still use them?" The answer is simple: because only recently have good in-ear monitor options become more affordable and accessible.

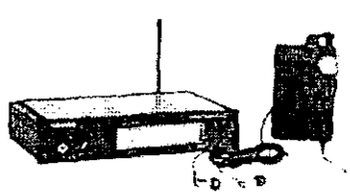
Now that personal monitoring systems are appearing on the platforms of even the smallest houses of worship, it's a good time to understand their advantages, learn how to select the personal monitor systems for your needs, and finds ways to maximize your investment in this technology.

First, let's look at a typical personal monitor system:

Personal monitor systems come in both wired and wireless versions:



Example of a wired personal monitor system



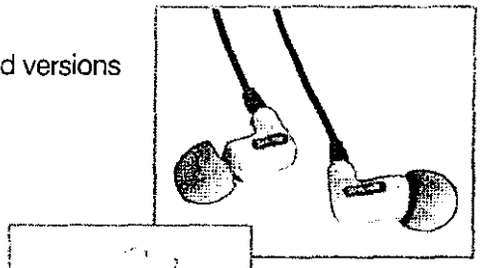
Example of a wireless personal monitor system

Wired personal monitor systems include two main components:

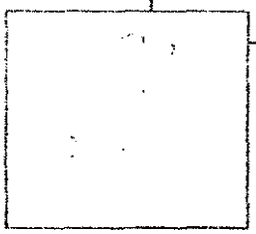
1. Bodypack receiver – receives the sound via an input cable directly from the mixer; often includes controls and status lights
2. Earphones – connect to the bodypack and direct the sound right into your ears

Wireless personal monitor systems include three main components:

1. A transmitter – converts the sound from the mixer into an RF signal, the same as done by wireless microphone transmitters
2. A wireless bodypack receiver – receives the RF signal from the transmitter and converts it back into sound
3. Earphones – the same as used for wired versions



Single-driver earphones with ultra soft flex sleeves



Triple-flange sleeves

A selection of earphone sleeves

Earphone foams and sleeves

While the earphone is a critical component to any personal monitor system, there is a component to the earphone that is just as critical to the entire in-ear monitoring experience: the sleeves.

Made from rubber or foam, these 'sleeves' attach to the end of the earphone and are the only part of the system that makes direct contact with your ear. For this reason, they must be comfortable, secure, and isolate correctly.

Some personal monitor systems come with a collection of these sleeves in various sizes. Since everyone's ears are different, finding the proper sleeves is, possibly, the most important aspect to getting the best sound from your personal monitor system.

It is important to consider all of the following tips and techniques:

- The earphones should come with a number of sleeve options such as foam and rubber, as well as small, medium, and large. Make sure all the people using earphones try all the various sizes and types, not just the ones that "look" right.
- Of the sleeves that come with the earphones, the foam ones usually provide the most isolation. Make sure everyone tries these before settling for rubber ones.
- Consider a custom-molded sleeve. Talk to your audiologist or contact a company that provides these. Since they will be made to precisely fit the user's ear canals, they will provide the best combination of isolation and comfort.

Optional components:

While the praise and worship team members can get all the advantages of using personal monitors 'straight out of the box,' there are a few components that are worth considering.

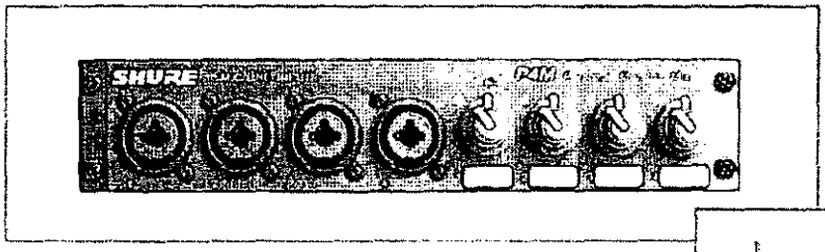
Personal monitor mixers

This type of mixer gives the user control over his or her own mix without affecting the signal path to the main house mixer.

A personal monitor mixer puts more control on the platform instead of relying so heavily on the person at the soundboard ... *if* that person even exists. Also, once set, the personal monitor mixer 'remembers' these settings so your praise ministry can have the same mix at every service.

This is of particular interest to 'portable churches' (churches that rent space on an hourly basis), which require fast set-up and tear down, but refuse to sacrifice sound quality for speed.

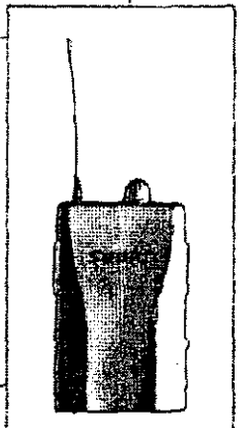
A personal monitor mixer is also useful for praise bands that travel and want to bring their pre-set mixes with them. This allows the control they need without relying too heavily on the person running the sound at the house of worship.



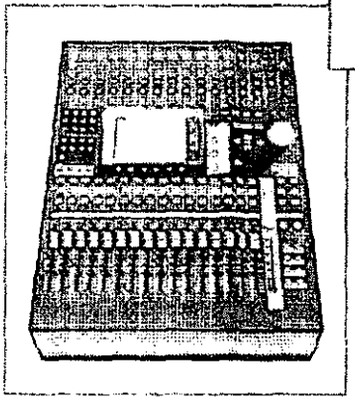
Example of a personal monitor mixer

Hybrid bodypack receivers

These receivers are capable of working with either wired or wireless systems. If your budget only allows for wired monitors, but you expect to be able to upgrade to wireless in the near future, hybrid bodypacks might be a good idea. This also lets you match your monitor configuration to the particular need of the musician, since there are times when a wired system is the better choice (e.g. a drummer). Additionally, there are systems that can be used wired and wireless at the same time, for added flexibility and adaptability (such as a click track plus monitor of the service).



Example of a hybrid bodypack



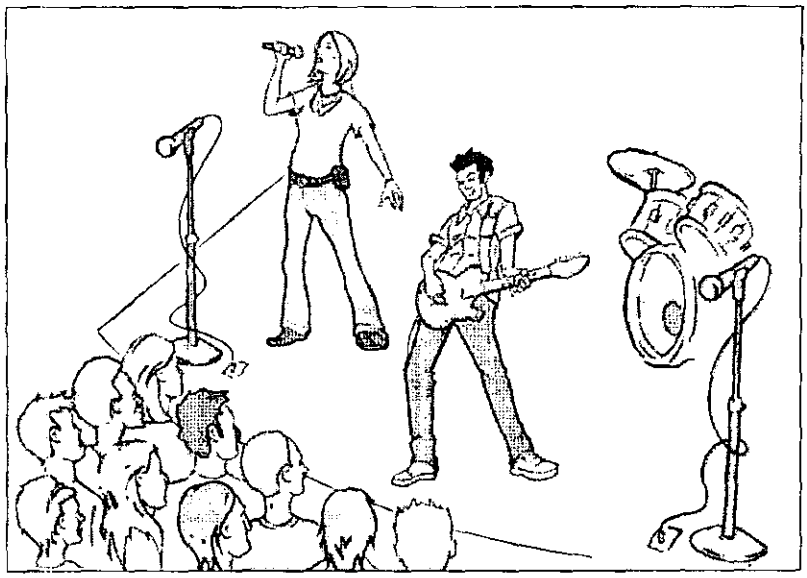
Example of a digital mixer

Digital mixer

When used with personal monitors, digital mixers can recall your individual mixes time after time, exactly as they were rehearsed in every environment regardless of any acoustic challenges.

Ambient microphones and other ways to solve isolation issues

No discussion on Optional Components for Personal Monitoring would be complete without some consideration of how to add the congregation into the mix, ambient microphones in general, or how to feel the music. These topics are discussed in a later section entitled "Is too much isolation too much of a good thing?"



Example of ambient miking

What is "Distributed Audio" and what does it have to do with Personal Monitoring?

Distributed audio refers to devices that accept analog audio from a mixer or other source, convert this signal to digital audio, then send this signal to a destination via *Category 5* (CAT-5) cable (which is high performance digital transmission cable also used for Ethernet connections). At the end point it can be converted back to analog and used however necessary.

The devices at the receiving end of the distributed audio network can be DSP devices, digital mixers, or an individual multi-channel "personal mixer" for monitoring.

The advantage of using a distributed audio system is the increased distance allowed between devices, plus the fact that CAT-5 lines are often already installed in many facilities.

Distributed audio therefore becomes very useful for monitoring systems since getting multi-channel mixes to many people becomes that much easier. Also, you can transmit the personal mix to anyone who wants the added mobility of wireless but also wants a customized multi-channel mix they can control with the personal mixer.

There is also the added benefit of the audio limiter function built into many in-ear systems that helps with hearing protection. While headphones can certainly be used, earphones provide better isolation, and are much less conspicuous and cumbersome.

The benefits to using personal monitoring systems in a House of Worship

Personal monitors allow the pastor, praise leader, musicians and choir leader to personally hear just what they want without affecting what others hear. These systems are comfortable, wearable amplification devices that are designed to replace floor wedges with earphones that are worn 'in ear.'

The advantages for the people on the platform and the overall house of worship sound are numerous:

Greater control:

Personal monitors provide the ability to select precisely which mixes the user wants to hear. They allow the user to control the volume and balance of these mixes.

More advanced systems let the users hear two different mixes and control the levels of these mixes.

Examples of this would include:

- The entire praise band as one mix AND the vocals as the second mix
- The sound from the platform as one mix AND the congregation through ambient microphones as the second mix
- The pastor (discreetly) as one mix AND the praise band as the other
- Or for the drummer: The praise band as one mix AND the click track as the other

Lower volume levels with higher sound quality:

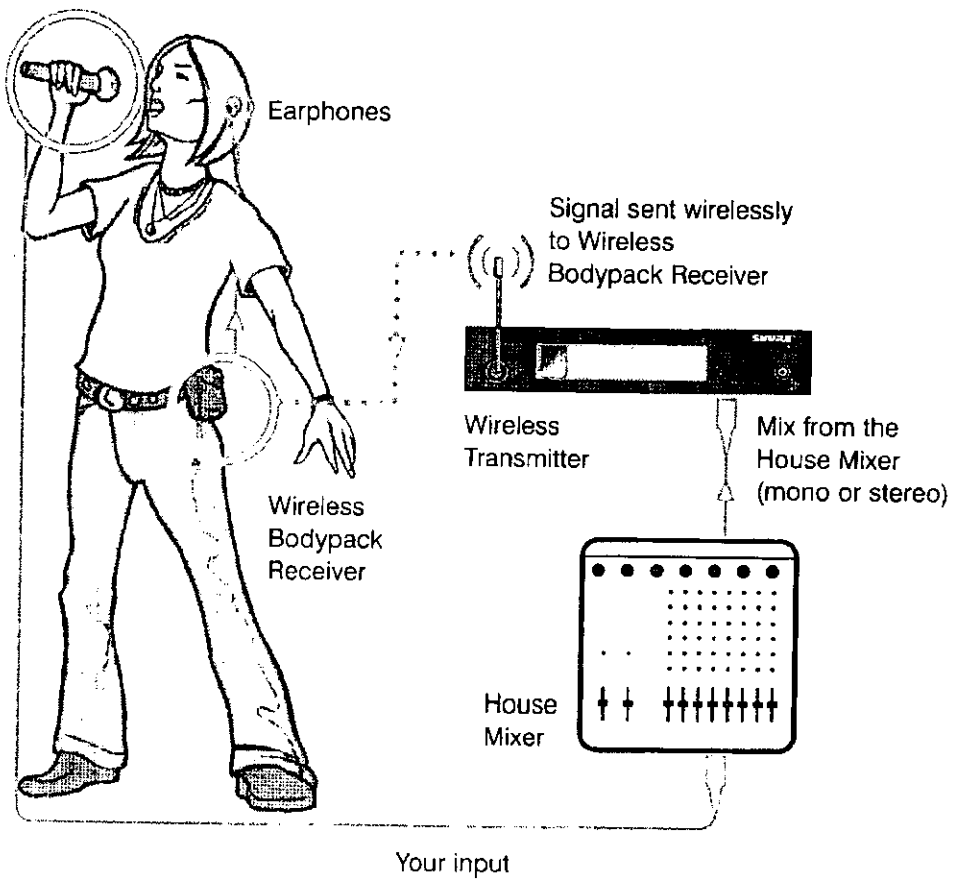
When the musicians and others are 'in ear' they enjoy high-fidelity sound at lower volume levels and with less interruption from outside noise.

Let's say, for example, the music is especially loud (which could be good). Should a musician decide to increase their monitor volume ever so slightly, they can do so by using a control at their waist instead of having to signal to (and wait for) the sound engineer. Plus, the increase in sound cannot be heard by anyone else on the platform, which avoids any resulting 'volume wars' where the other musicians must now increase their monitors to hear over this additional platform noise.

Additionally, personal monitor mixers, unlike floor wedges, allow the wearer to hear stereo mixes and/or adjust the relative level of these mixes using the balance control. [See *"Mono or stereo ... or more?"* later in this chapter for further discussion on this.]

Personal Monitor System:

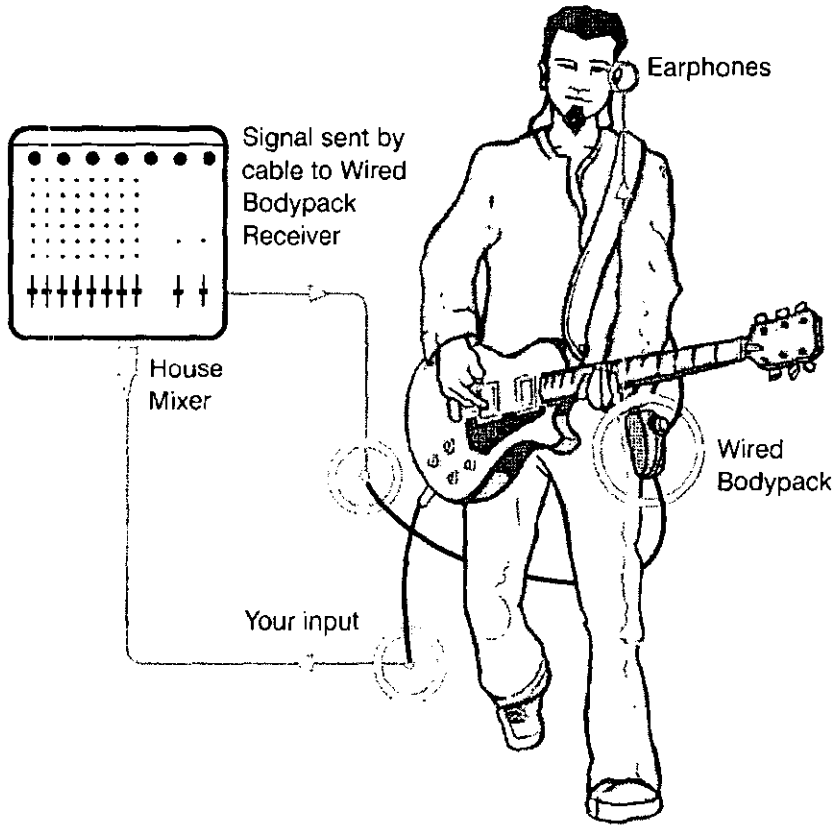
Vocalist Setup



Houses of Worship Guide

Personal Monitor System:

Guitarist Setup



A few words on the importance of hearing conservation:

We have touched on this earlier and we strongly believe that if you consider personal in-ear monitors for no other reason, you should consider them for hearing conservation benefits.

The potential danger of continual exposure to performance-level sound has been shown to cause permanent and significant hearing loss. This is why hearing conservation should be of serious concern to anyone who is a regular participant in auditorium-level sound and for those who recommend audio solutions.

Please note that people can still suffer hearing damage while using a personal monitoring system. Using any audio equipment improperly, without the limiter engaged, or at high-volume sound levels can be damaging to hearing.

For more information, talk to an audiologist or your doctor, or learn more at ***www.shure.com/hearing***.

Decreased vocal strain:

In order to compete with the sound coming from the floor wedges, singers often sing louder than necessary. This causes vocal strain and, unless the sound engineer is able lower this sound, also decreases the quality of the overall music. When the singers have the ability to better adjust what they hear, they do not need to sing louder to hear themselves, so they can sing more naturally. This is better for their throats and, of course, for the congregation's ears.

Tip: You might notice that when some singers try personal monitors for the first time, they will have a tendency to "under sing." This is because they hear themselves so well now they believe they are singing loudly enough. A good trick here is to turn their mix down somewhat so that they will produce the necessary level from their voice.

Virtually no chance of feedback:

Feedback is caused by sound from loudspeakers leaking into live microphones. The louder the sound and the closer the speakers are to the microphones, the more likely you'll get degraded sound for the audience and, when the volume is too great, feedback.

Since personal monitors do not throw sound back towards the microphones, as wedges do, the chances for feedback from this source are eliminated.

Portability:

This is an important benefit, of course, for touring groups, but it is a major time and back saver for those churches which meet in rented spaces, such as

schools, hotels, etc. Why lug around floor monitors, racks of amplifiers, equalizers (EQs), and cables, when you can have a small bag with your whole monitor system in it?

Houses of Worship Guide

Greater mobility:

When the sound is directly in the musician's ear, it makes little difference where he stands on the platform ... or off. He will hear the same mix at the same levels, which allows for more movement and interactivity. Suddenly, the entire platform is his "sweet spot".

Obviously this is more of a benefit for those who choose wireless personal monitor systems.

Fewer platform perils:

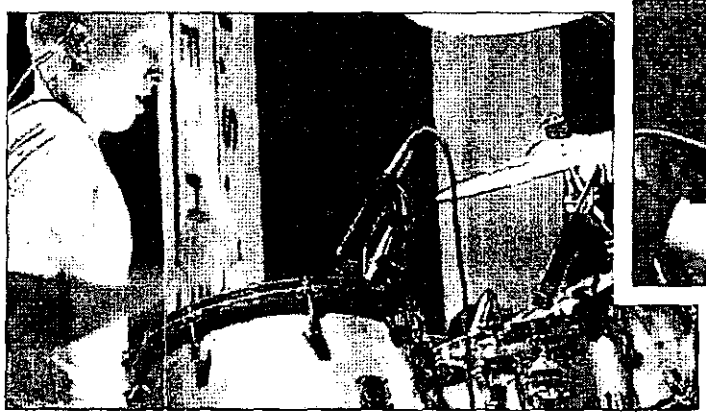
Here again, what you lose is what you gain. With personal monitors, you eliminate the floor wedges as well as the cables attached to them. This provides a cleaner, more aesthetically pleasing worship space with fewer boxes and cords to trip over.

The #1 reason? Improved sound quality for everyone:

The most important benefit of using personal monitors in a house of worship is the overall improved sound clarity for everyone involved. From the congregation to the worship team... from the front of the house to the very back seats.

What else can you do with personal monitor systems?

On the following pages, we have outlined a few additional uses that are applicable to houses of worship. We expect that once you have decided to include personal monitors in your house or worship, you will find many more.



Enable discreet communications

Pastors, praise leaders, and choir leaders can receive spoken cues and information during the service, either from others on the platform or even people elsewhere in the house.

Here are two examples of how this might work:

1. Provide your pastor with a lavaliere microphone that goes only into the praise leader's mix. In this way, the pastor can give the praise leader cues, such as changing the hymn or increasing the length of a particular song.

2. Add the producer's microphone to the pastor's mix. Now the pastor can receive cues from the person responsible for making sure the service runs smoothly.

Other times a user might want to receive spoken cues include:

- Providing timely information or details to the pastor or others during community meetings.
- To prompt on-stage directions or missing lines to actors in theatre productions and skits.
- Whenever you feel that someone might need to receive information discreetly.

Cue to the next part of the service.

More and more houses of worship are including pre-recorded music or events into their services. Personal monitor systems allow the wearers to hear these recorded events as they are being faded into the service. The musicians can soften their music accordingly or add any lead-ins right on cue. This provides the congregation with a more seamless experience.

Bring the service to a conference room or the nursery

Personal Monitor Systems can also be used to bring audio to another part of your church. Let's say you want to bring the sound of the service to the Nursery and you don't want to punch holes through the walls to lay speaker wire...

It's just like setting up a wireless mix for a musician on the platform. Place the bodypack for the personal monitor system onto a powered loudspeaker in the nursery. Insert the personal monitor's earphone jack output into the loudspeaker's input. This should let the people in the nursery hear the entire mix.

If you add ambient sound [See *"Add the congregation to the mix"* later in this chapter] you can provide the Nursery – or any room – with the complete audio experience.

Not only do you have walls without halls, you have just created what is technically referred to as a "Point-to-Point" wireless system.

Tip: By using a 'battery eliminator,' you can power the bodypack from an electrical outlet, which will save you from having to ever replace batteries.

Better rehearsals

It is very infrequent that the praise band has the luxury of performing on the actual platform. Personal monitors can quickly turn the worst rooms into a great place to practice, allowing you to hear more clearly by virtually eliminating the room's poor acoustics.

Is too much isolation too much of a good thing?

Personal monitors are designed to help improve the overall sound and provide isolation from platform noise and other distractions. It is this ability to create isolation from outside sound that allows people to listen to their mix at a more comfortable level. This level is typically lower than that of the platform.

One of the challenges, however, is to make sure the people on the platform are not entirely cut off from the service.

Here are two ways to help users get the isolation they need, yet feel as though they are taking full part in the worship. In other words...

Here's how you can make personal monitors sound really great:

Add the congregation to the mix

With a few strategically placed microphones, you can add the sounds of the congregation to the mix that is being sent to the personal monitor systems.

Once you have done so, the praise leader and other musicians will be able to hear the congregation without having to resort to removing one of the two earphones, which should be discouraged since doing so eliminates most of the benefits that the personal monitors provide.

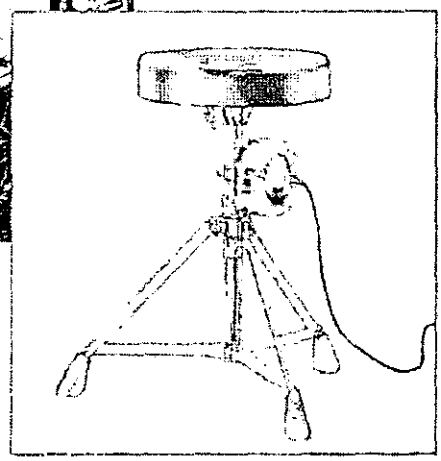
Some tips and techniques for ambient miking:

- *Place the ambient microphones on the edges of the platform facing the house. It is best to position the microphones in front of, above, and aimed towards the faces of the congregation.*
- *Do not place the microphones in the congregation.*
- *Make sure the microphones are properly oriented, so the microphones send signals to the correct ear. For example: It is important that sounds from the left side of the house are heard in the left ear of anyone monitoring the sound.*
- *When selecting which microphones to use, treat the congregation as you would a large group of singers. Condenser style microphones with an omnidirectional polar pattern are usually best.*

- *Do not be tempted to use shotgun microphones.*
- *Overhead (ceiling-mounted) microphones can be used, but are often far less effective and harder to control than on-platform microphones.*

Let the musicians 'feel' the music

Try a 'buttkicker' (also called *drum throne shaker*) to recreate the vibrations that drummers and bass players hear and feel when low-frequency sounds are amplified. Placed on the user's stool or beneath a riser, they provide physical vibrations along with the music.



Example of a drum throne shaker

How to select the right personal monitor systems for your House of Worship.

Houses of Worship Guide

When selecting personal monitoring systems for your house of worship, you need to answer all of the following questions:

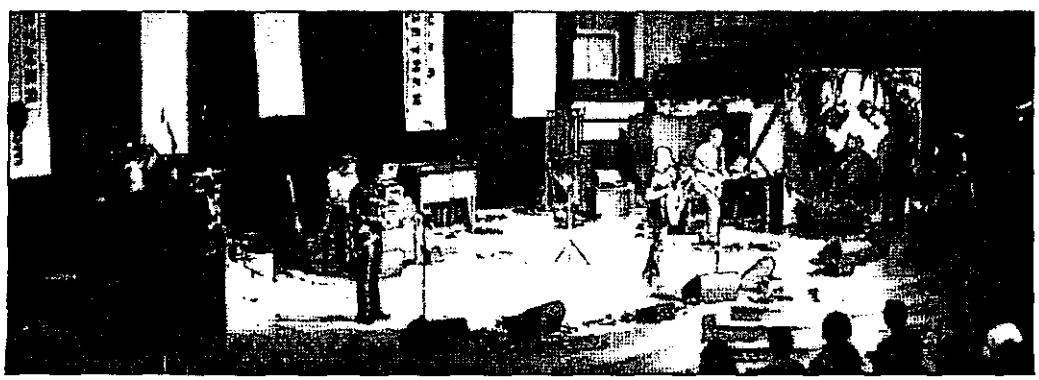
1. **How many people will be using monitors?**
2. **Will the users be stationary or will they want to move freely around the platform?**
3. **Can they share monitor mixes or will they need to have their own?**
4. **Stereo or mono?**
5. **What is the best use of your budget?**

Answering these questions correctly, and fully, before purchasing personal monitor systems will help assure you have the flexibility to meet the widest variety of services and that you have used your budget most wisely. With that in mind, let's look at each of these questions individually:

1. *How many people need monitors?*

First, consider the benefits to all of the people on the platform. Then decide if a personal monitor makes sense for each of these members of your worship ministry.

The praise leader – can hear his band and/or his instrument with no distractions; can sing at a level that is comfortable and more natural; can receive cues from the pastor or off-platform, as well as give his own cues back; can select what other mixes he or she wants to hear.



The members of the praise band, including guitarists, drummer, bass player, background vocalists, keyboardist, etc. – will be able to hear their own sounds without the 'volume war' associated with floor monitors; can hear the click track directly; can receive cues from the praise leader.

Tip: You probably already know which members of your praise band are the biggest 'volume war' offenders. This could be the best place to start when trying to get your team to adopt personal monitors.

The choir leader – all the same benefits as the praise leader. Choir leaders most commonly use personal monitors to hear the blend of the choir in the background.

The lead singers or the choir soloist – can sing at a level that is comfortable and more natural; can receive cues from the praise leader; can select what other mixes to hear; can stop worrying about echo or reverberation.

Note: Since choir members do not commonly monitor their sound, there is rarely a need to consider giving anyone except the soloist a personal monitor system.

The pastor – can benefit from being certain his or her message is heard more clearly; can speak and hear at levels that are more comfortable and natural; has the ability to receive discreet cues and other information; can choose which mixes he or she wants to hear.

Audio/Tech engineer – will also find many uses for a personal monitor system. A great technique that is employed by many audio engineers is using in-ear monitors to select the right spot for microphone placement, especially for room miking. When listening to the microphone with in-ear monitors, the audio engineer will hear only what the microphone hears and none of the reflections from walls or other obstructions. This makes selection of the best locations for microphones an easier and more accurate process. This is also useful when placing microphones in front of loud instruments like guitar amps and kick drums. The engineer can walk right to the front of the amp cabinet with a microphone and position the microphone for the best sound – all without being exposed to the louder than normal sound pressure levels.

2. *Will the users be stationary or will they want to move freely around the platform?*

Now that you have counted the number of people who might need personal monitors, determine whether or not they need to move freely around the platform. This will help you decide whether they can use wired personal monitors (which are less expensive) or if they might need the mobility of a wireless personal monitor. [See Chapter V for a further discussion on mobility.]

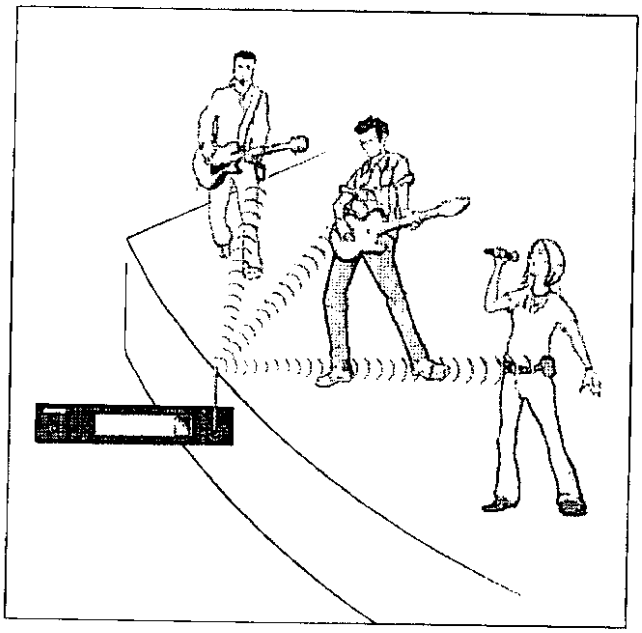
A good rule of thumb is as follows:

- Get wired versions for the drummer, keyboardist and back-up singers – all who will likely remain in a fixed place during the service.
- Choose wireless versions for the praise leader, guitarists, the pastor and any soloists – as they will benefit more from the freedom to move about the platform. It is also a good idea to get the choir leader a wireless system, since he or she is standing in a place where cables might cause other ministry members to trip as they go by.

3. *Can they share monitor mixes or will they need to have their own?*

First determine how many mixes are presently used and if this number of mixes would suffice.

Then, alongside where you noted whether each user required a wired or wireless version, make an additional notation. This one is for whether they can share the overall mix or might need to have a personal mix.



A single personal monitor transmitter can send the same mix to multiple receivers.

Shared mix – Everyone sharing a monitor mix will be listening to the same exact mix. So long as they can all agree, sharing a mix is an easier and more cost-effective way of providing 'in ear' monitoring for a larger number of people.

Tip: When two or more users are able to share the same mix, you need only give them bodypack receivers and can use a single wireless transmitter to send this mix to them all. For example: If a few members of a praise band want to hear the same mix, they can utilize the same wireless transmitter. This will let you provide two or more users with wireless monitoring for a lower cost than if they all have their own transmitter.

Remember: Every mix requires its own transmitter, but each person who monitors that mix only requires a receiver.

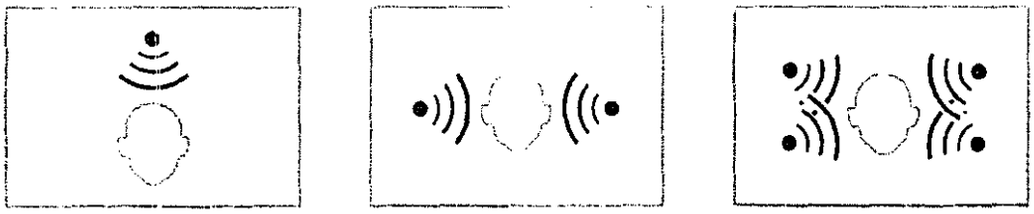
Personal mix – The music ministers will likely need to hear more than just the praise band. The praise leader and choir leader will want to design a custom mix for themselves. Likely the praise leader will want to hear the congregation via a mix provided by ambient microphones, so he will need a personalized mix. Vocalists, guitar players, and many drummers, also want to be able to isolate their own sounds from the rest of the band or add unique sounds such as (for the drummer) a click-track. In these cases, as well as any many others, the ability to create a personal mix is preferable and worth the added cost and effort.

Tip: If your current mixing console does not distribute enough mixes (auxes) to support all the mixes you need, you might consider... sharing mixes, using personal monitor mixers, adding a Shure Auxpander (designed to expand the auxiliary output capabilities of any standard mixing console), investing in a dedicated monitor mixer, or even upgrading your console.

4. *Mono or stereo ... or more?*

In *mono*, both earphones reproduce the same audio. Not optimal, certainly, but often this is the lowest cost solution.

In *stereo*, the earphones produce the fullest, most accurate monitor sound available. These include both a Left and a Right signal – just like your CD player and stereo system – and also enables lower listening levels by separating sounds spatially instead of purely by volume. For example, this lets a praise band with two guitar players hear one guitar in the left ear and the other guitar in the right ear, creating a more realistic listening environment. Also: If you include the congregation as one of the mixes, a stereo system will allow you to hear them more naturally, with sounds from the left side of the house coming through to your left ear, for example. In short: *If you can afford stereo, which most systems now provide, it is well worth the additional cost.*



Mono Stereo MixMode

Note: You need to make sure your present mixing console has the ability to transmit a stereo mix (stereo aux), or you might not be able to use this feature.

There is also...

- *dual-mono*; where you can get a different mono mix in each ear, and
- *MixMode*®; which is a proprietary Shure solution that allows you to hear two separate signals (such as a vocal and a band mix; or the band and a discreet communications channel) in both ears. With MixMode, the user can control the 'blend' or the relative volume levels of these two mixes with the balance (pan) control. MixMode is popular, especially, with praise band leaders.

It is important to test – and appreciate – all these options prior to settling on any particular choice. That being said, it's best to select at least stereo options for all the users if budget allows.

5. *Determine your budget.*

As with any purchasing decision, the amount you can afford to spend becomes a factor in what product features are 'need to haves' and which are 'nice to haves.'

Fortunately, the increased popularity of personal monitor systems has resulted in a wider variety of options to meet nearly any budget. Also, you can easily upgrade and add systems over time. (See Chapter V, "Start Small.")

Questions about Personal Monitor systems:

Can we try a Personal Monitor system before we buy one?

This is possibly the most common question we receive.

The answer is "yes," but it is unlikely you will get this answer at your local audio retailer, since they are probably not set up to do so. There is a good chance your sound contractor or audio representative can help arrange a trial. If not, contact the manufacturer directly. Often, they can help arrange a demonstration unit.

They feel strange, but everyone says I will get used to them. How long will that take?

Both wearing the earphones and the isolation they provide does take a little getting used to. Adding the congregation's reaction to the mix, by use of ambient microphones, can help remove some of the isolation. Either way, as with any new technology, you will soon get used to them and will just as quickly wonder how you expressed your worship without them.

Do I need a transmitter for everyone using a personal monitor system?

No. In many cases, more than one user can share the same transmitter, so long as they listen to the same mix and each have their own bodypack receiver, and earphones.

What if some band members want a personal monitor and some don't?

For maximum benefit, it is recommended that all band members be 'in ear.' In situations where some band members resist or budget does not allow you to provide personal monitors to every one in the band, it's acceptable to dip your toe in the water when bringing in these new technologies.

Some people take more time adopting earphones and forcing them to use something that makes them uncomfortable might affect their worship... which is not a good result.

While giving personal monitor systems to only one or two members of your praise band will not remove all the cables and wedges from the platform (which is the ultimate goal) it *will* decrease the number of wedges you require and will certainly help lessen the 'volume wars.'

Eventually your more reluctant team members will begin to see the advantages of personal monitor systems and might even dive in themselves.

What's happening? I'm playing "Amazing Grace" but I'm hearing a newscast.

This is interference from a local television station. Since wireless monitoring transmits sound on unused television channels, it helps to choose a model that lets you search effortlessly between frequencies. This should help eliminate unwanted interference from outside sources.

I only have one output available on the mixer and I use that for the wedges. How can I add personal monitors?

Most personal monitor systems can also be used as pass-though devices for other personal monitors or floor monitors.

Here's how to do it:

1. Connect the input of the personal monitor transmitter to the monitor or aux output of the mixer.
2. You can now connect the floor monitor amplifier to the outputs on the personal monitor transmitter. Or you could connect another personal monitor system. In fact, you can daisy chain as many of these together as you want.

   This lets you maximize the soundboard's one output. Also, users can change the volume they hear in their ears without affecting the level of the sound going to the other monitors.

Can I use a reverb unit or some sort of digital processor on my in-ear mix?

Yes, of course. But note that you are adding a little more delay in the signal that could be an issue with timing. Try any set up before you use it live to make sure there are no issues.

We have a lot of stained glass windows in our church. Does this affect my choice of monitoring systems?

Yes, if you mean whether you select floor wedges or personal monitoring systems. Stained glass windows (or *any* glass windows, in fact) are some of many architectural details specific to houses of worship that can cause reverberation and acoustic issues. Personal monitoring systems can help decrease the overall volume, which helps clean up the sound in reverberant houses of worship.

Can personal monitoring systems help with recording and broadcast needs?

Yes. Directors and producers looking to capture the service on CD/DVD can benefit from personal monitors. You can also use the monitor mix to record your music.

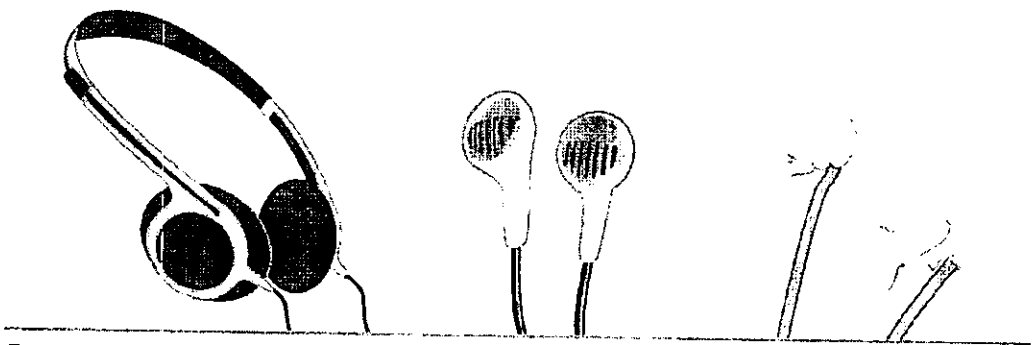
Contact your sound contractor or the manufacturer for more details on the added value of personal monitors or personal monitoring in these situations.

Chapter IV: EARPHONES

We have already discussed earphones as part of the personal monitor system as well as how to provide your worship ministry with the proper sleeves for fit, comfort, and isolation. (All in Chapter III.)

The purpose of this chapter is to consider the advantage of earphones on their own. There are a few reasons to consider using earphones in your house of worship, regardless of whether or not you decide to use personal monitoring systems:

1. They provide an improved level of sound clarity
2. They are more aesthetically-pleasing than headphones
3. They can easily integrate with other audio products you currently use



Improved sound clarity

All the premium components in a signal path are rendered ineffective by a low-quality listening device. You have already experienced this phenomenon with your cell phone and your CD or MP3 player. The same holds true on the worship platform. When considering which listening device to use, you need to consider two key concepts: isolation and precise sound reproduction. In both cases, more is better.

Isolation

Whenever you see a singer put their hands over their ears – even when they are wearing headphones – you are seeing a symptom of a lack of isolation.

Simply put, isolation is the ability of the listening device to eliminate background noise. Better isolation means fewer distractions from unwanted sounds and the ability to listen at lower – and safer – volume levels.

Vocalists will also tend not to 'over sing.' That is, they will not feel they need to compete vocally with what is coming into their ears. This, too, will result in more natural, textured vocals.

For purposes of isolation, listening devices can be ranked in the following order, from best to worst:

Earphones – since these include sleeves that can precisely match the contours of the ear canal, they provide maximum isolation from background and ambient sound.

Headphones – the isolation provided by headphones varies considerably, depending on how well they cover the ears, their shape, the quality of the materials used, and the usage for which they were intended. (Note: many headphones were not designed for live sound or use in large, open spaces.)

Earbuds – basically, these are tiny, often low-quality headphones. Earbuds are designed for aesthetic purposes or to meet smaller budgets, not primarily for sound quality. They usually provide very little isolation.

Another advantage to proper isolation: less "bleed through."

How often have you sat next to someone wearing headphones and you can hear their music almost as well as they can? This is called 'bleed through' and it is distracting on the platform and in the congregation as well. Proper isolation lets the listener hear at lower volumes, decreases the overall volume required, and isolates the sound from others.

Precision sound reproduction

The internal working of headphones, earbuds, and earphones vary considerably and a discussion on types and benefits can quickly become overly technical even for an advanced user.

So how can the non-technical user get a good idea of which earphones, headphones or earbuds provide the best sound reproduction? The answer is simple: try them.

Before you invest in a large number of listening devices for your house of worship, it is best to try a few of them. Some retail stores will have a selection of headphones and earbuds for you to sample. Fewer will let you try earphones, which is unfortunate since these often provide the best sound quality. The good news is that there are many sound contractors, audio equipment representatives, and manufacturers that understand the importance of the house of worship market and would be happy to let you sample products prior to purchase. If you ask around, you will most likely be rewarded with earphones you can try.

Tip: Do not use the music they provide; bring your own CD. Different listening devices do better and worse for high and low frequency sounds and the CDs the manufacturers provide take this into consideration. In other words, they will supply music that sounds best on their products. When you listen using your own CD you will...

- know what you are hearing or missing, and
- be better able to compare apples to apples

Another tip: Perform your tests in both quiet and noisy places. While your music might sound better in an enclosed room, you are trying to duplicate the sound on the platform, which is anything but enclosed!

What's the best place to try earphones? At rehearsal with your team, of course.

Earphones are more aesthetically pleasing

As house of worship sound becomes richer and more complicated, the people on the platform need to isolate their own sounds better. This has resulted in more and more people, especially the lead and backup singers, wearing headphones. While helping the singers provide richer sound, the headphones are distracting to the congregation and make it harder for the worshippers to connect, personally, with these members of the worship team.

More connection for the congregation.

Earphones fit snugly in the ear and utilize thin cables that go under the collar so they cannot be seen at all from the congregation. And, as discussed above, they provide superior isolation, so the vocalists can sing at more natural levels.

Avoid 'headphone hair.'

Your worship team has spent a great deal of time and energy looking their best. Unlike bulky headphones, wearing earphones will not disturb their hair or any head coverings. They can easily wear earphones with hats, scarves, etc.

So, who gets earphones?

All personal monitor system users should include earphones as part of their system, so the praise band, the choir leader and pastor should already be 'in ear.' If not, and they wear headphones, you should replace these headphones with earphones as they look more natural, receive better quality audio at lower volumes, and do not distract others with their 'bleed through,'

While the same argument can be made for giving earphones to everyone on the platform who now wears headphones, it really comes down to your budget.

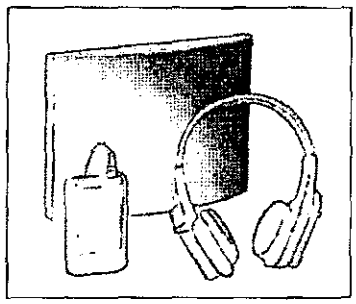
Unless you are purchasing high-end headphones, you will probably spend more per set on earphones than you do on headphones.

Earphones can be used with other audio products as well.

So far, we have discussed using earphones as part of a personal monitor system and as a replacement for headphones while on the platform. The good news is that earphones can replace headphones in *nearly all* applications, such as:

- ***Personal monitor systems that did not come with isolating earphones, such as Hear Back and Aviom.*** There is no reason you have to use the headphone or earbud supplied with the system you have now. You can add all the advantages of isolating earphones by simply unplugging the current headphones and plugging in the earphones you want.

- ***Assistive listening systems,*** such as those provided by Phonic Ear, Gentner, and more. Here, again, simply use isolating earphones instead of the headphones provided.



An example of an assistive listening device.

Note: While you might need to have a container of sleeves on hand for congregation members using assistive listening systems, you should find that the lower-profile and increased sound quality (for both the user and the people sitting near the user) are well worth the added effort.

- ***Consumer products***, including CD players and MP3 players, such as iPods. Isolating earphones have become extremely popular for people who enjoy hearing the subtleties of their music. This means you can enjoy better sound quality when you are away from the church and get more value from every set of earphones you purchase.